

"As all are liable to the sad visitation of insanity—the person of refined and sensitive nature as well as others—and as the radical principle of all insane hospital treatment is that of regulated association of numbers together, this subject cries loudly for the aid of the philanthropic legislator. Now, while the penitentiary at Joliet is in process of construction, is the time when this reproach should be taken away from this institution. Every prison, of course, has its infirmary, and it only needs the attachment of some rooms of greater strength to give such cases of insanity as may arise comfortable accommodation. Then, the repeal of any act authorizing the transfer of such cases would forever remedy the evil. Either this must be done, or the ends of justice and the designs of philanthropy must continue to be infringed.

"The subject reduces itself to the plain question: '*Which is the more proper, to have a hospital attached to a penitentiary, or to have a penitentiary attached to a hospital?*' The former is a necessity in all instances, a humane juxtaposition, which should never be wanting: the latter is a needless incongruity, corrupting to the whole employed corps of the hospital, and, if suffered to continue, would surely be eventually regarded as a reproach upon the ruling sentiment of the State."

We perceive in this report an error in the estimation of the net value of the productions of the farm, such as we have heretofore noticed in several of the reports of similar institutions. Among the items of those productions are, corn \$1931, hay \$1225, and milk \$4672. Now it is to be presumed that a large part of the corn and hay were expended in the production of the milk. Hence the value of all that was so expended is reckoned twice, making the profit or income too large by the amount of that value.

P. E.

ART. XVII.—*Microscopic Anatomy of the Lumbar Enlargement of the Spinal Cord.* By J. DEAN, M.D., communicated to the Amer. Acad. of Arts and Sciences, by Prof. J. WYMAN, Nov. 14, 1860. Cambridge, 1861: pp. 21, quarto, with 4 plates.

THE substance of this very creditable memoir will readily be gathered from the following conclusions at which the author arrives:—

"1. That true nerve cells exist only in the gray substance, these cells being connected by their processes in more or less definite groups; but not probably, as some authors maintain, so as to form an uninterrupted chain from brain to *filum terminale*.

"2. That the anterior roots arise partly from nerve cells, another portion being directly continuous with the posterior roots. A part of the posterior roots also enter cells.

"3. The roots may therefore be divided into three classes: 'such a division does not, however, imply any functional difference.'

"(1.) Anterior and posterior roots which arise from or terminate in anterior or posterior cells.

"(2.) Anterior and posterior roots which meet in cells near the central part of the gray substance.

"(3.) Anterior and posterior roots which are directly continuous.

"4. That bundles of anterior roots are connected with those above and below, by looped fibres proceeding from cells which some of the roots enter; these fibres leaving the gray substance, and passing sometimes upwards, sometimes downwards through the anterior columns, finally curving inwards to join some other bundle of anterior roots with which they pass into the gray substance.

"5. That thus fibres from nerve cells, after passing upwards through the longitudinal white columns, do not *all* continue onwards to the brain, but most of them re-enter the gray substance at a greater or less distance from the point of exit, sometimes probably becoming again connected with cells, and again emerging from these as longitudinal fibres.

"6. That the processes from a single nerve cell, whether in the anterior or posterior cornu, do not necessarily *all* pass into the *same* bundle of roots, but often pass into three or four different bundles; a cell process also sometimes sending branches into different bundles. Thus we may have sensitive impressions from different parts of the surface conveyed to one cell, and motor impulses distributed from one cell to different points.

"7. That all the anterior and probably all the posterior roots enter the gray substance, though the posterior roots often pass into the cornu at a considerable distance from their first entrance into the cord.

"8. That most of the fibres from the posterior roots, after traversing the posterior columns, are collected into transverse bundles, traversing the *substantia gelatinosa* in a slightly ascending course, after passing through which they curve downwards (sometimes upwards), forming, by the longitudinal course which they then maintain for some distance, a very interesting series of longitudinal bundles, which I have called *longitudinal columns of the cornua*, standing in a very close relation to the *posterior vesicular columns* of Clarke, with the cell processes of which many of their fibres are continuous.

"9. That some of the bundles which traverse the *substantia gelatinosa* do not pass into the *longitudinal columns of the cornua*, but proceed directly across the gray substance, becoming continuous with the anterior roots.

"10. That the posterior white columns are composed almost entirely of the posterior roots, which merely traverse them before entering into the gray substance. They appear, however, to receive a few fibres from cells situated on the extreme margin of the posterior cornua, and some more or less longitudinal fibres from the looped recurrent bundles.

"11. That the posterior roots are connected by curved fibres or bundles of fibres, proceeding from one root and curving round after penetrating the gray substance, becoming connected with some other root above or below. The same is seen in transverse sections with regard to roots situated side by side, both anterior and posterior, the looping fibres sometimes proceeding directly from root to root, and sometimes passing through cells.

"From which it results that the same fibre must in different parts of its course conduct both centrifugally and centripetally.

"12. That, besides the looped recurrent fibres, the three principal courses taken by the posterior roots before entering the gray substance are with reference to a longitudinal plane, ascending oblique, descending oblique, and transverse."

We have thus presented Dr. Dean's conclusions, embodying as they do the gist of his paper. We cannot go into the elaborate task of discussing them in this place, and showing how far they agree with the opinions of other investigators, and in what they differ from them, though in a general way we may remark, they agree best with the opinions of J. S. Clarke.

Suffice it to say that the paper is the evidence of an honest attempt to work out a most difficult problem, of the highest physiological importance. And that if, after its perusal, we are still compelled to regard the course of the nerve fibres in the spinal cord, and their relations to the nerve cells, as among the unsettled problems, which minute anatomy has as yet incompletely answered, we do so with a full appreciation of the value of Dr. Dean's effort, and with the hope that he will persevere in the difficult and honourable investigation upon which he has made, what every one who knows by experience the difficulties of the subject must regard as a most creditable and praiseworthy beginning. As a matter of some interest we subjoin in full the mode of preparation employed by him in the studies.

"The method of preparation usually employed was a modification of Gerlach's and Clarke's, although many others were employed, according to the object in view. The following method gave the best result from which to make drawings. Thin sections from the cord, hardened in alcohol, were washed a few minutes in pure water, and then immersed in glycerine to which Gerlach's solution of carmine,¹ previously filtered, had been added; in this the sections were allowed to

¹ Solution of carmine in water, to which a few drops of strong ammonia have been added.

remain 4 or 8 hours, according to the tint desired (a light tint interfering least with the details and sharpness of outline). I have been able to obtain more delicately coloured specimens, and more clearly defined structure by the use of glycerine than by any other method. The sections are then washed first in pure water, afterwards in strong alcohol, in which they are allowed to remain about an hour, and are now ready for preparation with turpentine, according to Clarke's method; they may be put up in Canada balsam, or, as I have found very advantageous, in thick colourless copal varnish, which often preserves minute details better than balsam; although Stilling and others have found much fault with Clarke's method of preparation, on account of the too great transparency it sometimes gives, I am convinced that, with practice and some slight modifications, it is the only one suited to the minute study of the cord, other methods seeming to me, after thorough trial, quite unsatisfactory as compared with Clarke's. As a hardening material, I have often employed chromic acid with considerable advantage; but when colouring matter is used, alcohol is most suitable, and is certainly much easier to succeed with."

In conclusion we may bestow praise on the four plates which illustrate the memoir, and which we are told were etched upon the copper by the author himself. They are evidently faithful likenesses of the preparations from which they are drawn, which more than counterbalances any little want of artistic elegance in their execution.

J. J. W.

ART. XVIII.—*Researches upon the Venom of the Rattlesnake; with an Investigation of the Anatomy and Physiology of the Organs Concerned.* By S. WEIR MITCHELL, M. D., Lecturer on Physiology in the Philadelphia Medical Association. Published by the Smithsonian Institution, January, 1861. Pp. 145. With twelve wood-cuts.

THE industry, perseverance, and experimental skill displayed in this monograph reflect much credit upon the author. From the preface we learn that "during a large part of two years he has given to this work almost all the leisure which could be spared from the everyday exactions of his regular professional duties."

The essay is divided into seven chapters. The first contains some general observations upon the habits of the *Crotalus* when in captivity. In the second is described the anatomy of the venom apparatus. The third treats of the physiological mechanism of the bite of the *Crotalus*. The fourth is devoted to the consideration of the physical and chemical characters of the venom. In the fifth, sixth, and seventh chapters, the toxicology of the venom of the *Crotalus* is considered. Chapter eighth treats of *Crotalus* poisoning in man.

The last four chapters more particularly commend themselves to the practitioner of medicine, who is occasionally called upon to treat cases of rattlesnake bite and its dreadful constitutional effects.

From his numerous experiments upon different animals, Dr. Mitchell concludes—

"1st. That the heart becomes enfeebled shortly after the bite. This is due to direct influence of the venom on this organ, and not to the precedent loss of the respiratory function. Notwithstanding the diminution of cardiac power, the heart is usually in motion after the lungs cease to act, and its tissues remain for a time locally irritable. The paralysis of the heart is, therefore, not so complete as it is under the influence of *upas* or *corrova*.

"2d. That in warm-blooded animals artificial respiration lengthens the life of the heart, but does not sustain it so long as when the animal has died by *woorara* or decapitation.

"3d. That in the frog the heart-acts continue after respiration has ceased, and sometimes survive until the sensory nerves and the nerve-centres are dead, the motor nerves alone remaining irritable.